



Biodiversity Conservation at the Landscape Scale

A Program of the Wildlife Conservation Society
Supported by the USAID/ EGAT Global Conservation Program

The Eastern Steppe Living Landscape: Sustaining Wildlife and Traditional Livelihoods in the Arid Grasslands of Mongolia

Implementation Plan FY 2006

October 2005 – September 2006

Program Goal

To ensure conservation of biological diversity in regions of global biodiversity importance, using a species-based landscape approach.

The Wildlife Conservation Society believes that protected areas must remain at the core of all nations' biodiversity conservation plans. These areas typically contain a higher diversity and abundance of plants and animals than landscapes managed primarily for economic use. Yet, parks and reserves are always embedded in larger, human-dominated landscapes and are seldom sacrosanct. Regardless of how large or small a protected area may be, the plants and animals it contains are often threatened either directly or indirectly by human resource use activities.

Management of parks and reserves cannot, therefore, occur in isolation from the surrounding human-dominated landscape, but must take into account where and how human activities conflict with biodiversity conservation, and where conservation adversely impacts human welfare. As human populations continue to expand over the next 50 years, the incentive for over-exploiting natural resources within and outside of protected areas will likely increase and the need for biodiversity conservation tools that address human-wildlife conflict will become even more important.

WCS's Living Landscape Program (LLP) promotes conservation of landscapes by focusing efforts on key animal species that require large areas for their conservation, are particularly at risk because they cross land use and jurisdictional borders, and when protected will have the greatest positive impact on biodiversity as a whole. These landscape species are highly mobile, vulnerable animal species, and their conservation fosters a focused and cost-effective way to retain a full complement of biodiversity and overall ecological integrity. To conserve these species, parks and reserves must be integrated into the broader landscape, a landscape in which people exploit natural areas and wild species to meet their socio-economic needs.

The GCP/LLP Program is designed to ensure biodiversity conservation in four core sites by identifying actions to conserve landscape species, and by increasing the capacity of local and national organizations to implement such actions. The four areas of global biodiversity importance for WCS involvement with USAID support are:

- Northwestern Bolivian Andes Landscape Conservation Area (Bolivia)
- Glover's Reef Living Seascape (Belize)
- Maya Biosphere Reserve Living Landscape (Guatemala)
- The Eastern Steppe Living Landscape (Mongolia)

The Mongolia Eastern Steppe Living Landscape Project

The Eastern Steppe of Mongolia (Figure 1) is the world's largest intact grassland ecosystem. At about 250,000 sq km, the area is roughly the size of the state of Oregon. This vast wilderness is home to one of the world's last great spectacles of migrating ungulates, the Mongolian gazelle, which may number over a million. Numerous other mammals live on the steppe, including wolf, roe deer, endemic subspecies of red deer and moose, Siberian marmot, corsac fox, and Pallas' cat, and there are many rare or critically threatened birds, such as golden eagle, steppe eagle, saker falcon, black vulture, great bustard, swan goose, and six species of cranes (over half the world's species). The steppe is of international importance (a Global 200 Ecoregion, a Last Wild Place, and the location of Mongolia's first Ramsar site), especially when compared to the degraded steppe in neighboring Russia and China. To date, WCS is not

aware of any scientific analysis or monitoring of the vegetation quality of the Eastern Steppe. In fact, one of the threats facing Mongolia is the lack of scientific information regarding the conditions of its wildlife, biodiversity, and ecological health of the landscape. However, it is known that Mongolia has not yet instituted large-scale agricultural or industrial activities on the Eastern Steppe, unlike its neighbor to the south. Studies have documented that such large-scale operations have had devastating effects on Inner Mongolian grasslands, including desertification.

Human populations on the steppe have historically been sparsely distributed and engaged in traditional nomadic livestock production, which have had minimal impact on the ecosystem. This historical pattern of sustainable use of the steppe's resources has been disrupted by major socio-economic changes during the past twelve years. Rising urban unemployment has increased reliance on hunting of wildlife for subsistence and income, while declining markets for meat and other livestock products have increased poverty among herders. The country's economic needs are also driving oil, coal, gas and mineral exploitation of the Eastern Steppe. Still more demand is driven by China, whose effectively limitless resource needs are drawing it to the rich opportunities in Mongolia. The steppe is also the target of specific development interests funded by the United Nations Development Program, the Asian Development Bank and other international agencies. In the face of these myriad pressures, the development of a comprehensive conservation and natural resource management plan to preserve the integrity of the steppe, its wildlife, and the unique, traditional nomadic culture of its people is overdue.

Since starting work in the region on gazelle research, WCS has collaborated with the full range of stakeholders on the Eastern Steppe. This collaboration will provide an invaluable foundation upon which we intend to promote integrated, large-scale wildlife conservation and natural resource management. WCS has an extensive history of contacts and relationships with community members through our partnership with the former UNDP-GEF Eastern Steppe Biodiversity Project (ESBP), under whose auspices we have worked on gazelle conservation for the past four years. Our work in the region has led to regular contact and conversations with local herders and frequent meetings with soum and aimag government officials. In addition, WCS has trained local students and community members as research assistants. We have collaborated with the Mongolian Academy of Sciences, the Ministry of Nature and Environment, and the National University. We have also worked closely with at least eight local and international NGOs working or considering work on the steppe. Through our contacts, WCS will continue to be able to foster close coordination among individuals and organization working on the Eastern Steppe, including leveraging previous activities, promoting coordination of sound strategies and adaptive management, community based resource management, and landscape-scale monitoring efforts.

To ensure conservation of the Eastern Steppe's biological diversity, the WCS program focuses on three interrelated objectives, and a fourth objective which is the mandate of the New York Coordination Unit:

1. Develop and adopt participatory strategies to reduce threats to wildlife in the Mongolia Eastern Steppe landscape.
2. Develop and implement sustainable and adaptive mechanisms to strategically address threats across the landscape.
3. Learn and teach best practices in the Mongolian Eastern Steppe landscape and beyond.
4. Guide the design and testing of wildlife-focused planning

Total Anticipated Level of Effort in FY 06

IMPLEMENTATION PLAN: FY06

OBJECTIVE 1: Develop and adopt participatory strategies to reduce threats to wildlife in the Mongolia Eastern Steppe landscape.

Activity 1.1 Refocus efforts to refine an explicit model to articulate the causal relationships among conservation targets and threats and choose a suite of landscape species

The conceptual model, built to identify our operational conservation objectives, and explicitly link both direct threats (e.g., poaching) and indirect threats (e.g., lack of effective laws) to our conservation goals, is a key component of the Landscape Species approach to conservation. The conceptual model is strengthened by efforts to improve our level of understanding of each of its components. As the quality of the information included in the model improves and new components (e.g. threats) are added it is necessary to reexamine and refine the model so it can be used to effectively

identify strategic interventions that explicitly address key threats to the conservation of wildlife and the steppe landscape.

Year 1 and Year 2 of the program have focused on gathering and improving the information available to WCS, local stakeholders, our project partners and the government of Mongolia on the wildlife species that inhabit the steppe landscape and the threats to the conservation of the wildlife and wildlands of the region. The conceptual model, built at the outset of the Eastern Steppe Living Landscape Program in 2003, will be strengthened by incorporating the knowledge that has been gained through program activities in Year 1 and 2. The recruitment of a new country program director and plans to reach full staffing levels in the fall of 2005, provides the opportunity to revise and refine the conceptual model for the Eastern Steppe. The improved knowledge of the status of our conservation targets (e.g. gazelle and marmots), the relative importance, severity and location of threats, and the identification of important partners in conservation will only improve potential for success.

The conceptual model revision will first involve a refocusing of efforts to analyze and synthesize our Threats Assessments (see Activity 1.2 Threats Assessment) to further refine the indirect and direct threats outlined in the original conceptual model with the goal of updating the Threats Landscape for the Eastern Steppe. Finalization of the Threats Assessments will be followed by the selection of our Landscape Species, or target species for landscape conservation. We will include a range of partners (in particular National University of Mongolia, Mongolian Academy of Sciences, Protected Areas Administration, and former Eastern Steppe Biodiversity Project staff) in our selection of Landscape Species, focusing on people who are experts on individual species, but also soliciting input and review from stakeholders. Both the Threats Assessments and the Landscape Species Selection process will more explicitly define our conservation targets (see Activity 1.3.1). We also plan to use information from research and building of Biological and Threats Landscapes (See Activity 1.3.2) to help strategically focus our conservation interventions on important threats and those areas in the steppe where our conservation interventions are most needed. Refining the model this year and in upcoming years will ensure that future decisions, both in this project and within Mongolian government bodies, are made with a more complete understanding of how these decisions will impact conservation targets across the steppe ecosystem.

Results/Outputs:

In early 2006, we will have completed a revision of our initial conceptual model of conservation in the Eastern Steppe, reflecting greater information and the input of additional actors in the region (including state agencies such as the Environmental Protection Agency, Protected Area Agency, NGOs, local herders, etc.). This more complete and explicit model will inform project strategies, future decisions, activities, and outputs, and will also provide information to help inform other conservation and development projects planned by the government and other NGOs. The model will represent best available information. Thus, we should note that the model will continue to be revised in future years, as the Landscape Species Analysis is continued and as additional partners contribute to the process.

Once the suite of Landscape Species is chosen (see Activity 1.3.1), individual conceptual models will be developed for each landscape species describing direct and indirect threats, interventions, objectives, goals, and the interplay between these conservation strategies.

Threats Addressed:

One of the principle threats facing the Eastern Steppe is poor management decisions based on a lack of scientific knowledge about integrity of the landscape, conservation targets, their threats, and the relationships among them. The creation of more explicit models will help to ensure that future decisions, both in this project and within Mongolian government bodies, are made with a more complete understanding of how these decisions will impact the biodiversity and integrity of the steppe landscape, and the conservation targets that represent this ecosystem. We expect that upcoming decisions on road development in the Eastern Steppe, expansion of the protected area network and environmental laws to facilitate community based natural resource management should be influenced by such strategic planning.

Activity 1.2 Identify principal actors to address threats, evaluate their capacity to do so and engage them in specific interventions

In Year 1 and Year 2, we developed relationships with numerous agencies and organizations active in Mongolia's natural resource sector. We have partnered with many of these agencies and organizations during the Project's first two years by co-hosting national and international conferences and workshops with the goal of sharing information and informing natural resource management policy. We plan to use the linkages we have developed across the political landscape to promote collaborative activities to reduce the threats and conserve the species identified during the Threats Assessment (see Activity 1.3.2) and Species Selection processes (See Activity 1.3.1). The relationships with identified principal actors developed in Year 1 and Year 2 will be maintained and others will be sought following the approach used in previous years.

First, WCS will continue to hold regular meetings with our key partners in the government ministries, parks and protected area administrations and the academic and research community to explore the potential for collaborative work coordinate efforts and adopt common strategies aimed at understanding and addressing threats to the Eastern Steppe. A formal MOU will be signed with the National University of Mongolia (NUM) to strengthen general collaboration and to establish the mechanism by which NUM students will be identified for participation in the WCS internship program (see Activity 2.4). Efforts will be made to improve our working relationship with the Ministry of Nature and Environment by reestablishing a schedule for quarterly meetings.

Second, WCS will continue to sponsor and host a monthly conservation information and networking event to encourage discussion, sharing of information, coordination and collaboration among the many and disparate organizations and individuals involved in conservation in Mongolia. This year, themes will be selected and an effort will be made to present multiple perspectives on these issues through presentations by a diversity of participants.

Third, WCS will encourage stakeholder participation in the Landscape Species Approach to conservation by presenting the findings of the Threats Assessment to the original workshop participants on the Eastern Steppe, including a subset of the herders who participated in our "ger assessments" (informal but explicit interviews designed to determine local community perspective on threats to the environment and livelihoods of the steppe system). The findings will be presented and the process by which the Threats Assessment and their contributions were used to inform the Species Selection process will be explained. Opportunities for their feedback and comments on the conclusions of the process will be encouraged. This information will be used to evaluate the spatially explicit landscape model built with the information gathered during the Threats Assessment (see Activity 1.3.2). Further, this information will be used for planning conservation initiatives, both by this project (refining the project's conceptual model) and by the government of Mongolia. Through this process, links and relationships will also be created between the project staff, local community members and government officials.

Results/Outputs:

Through our extensive meetings with key players in Mongolian conservation, WCS will nurture relationships with other conservation organizations and will actively develop collaborative ventures with a number of them, including WWF-Mongolia, UNDP-GEF, World Bank, IPECON, ITF, TNC, National University of Mongolia, the Mongolian Academy of Sciences, Ornithological Society of Mongolia, Sustainable Grasslands Initiative, and others. Through the monthly conservation networking event, WCS will continue to be a focal point for conservation initiatives in Mongolia, and serve to disseminate critical conservation information among key players.

Participation of stakeholders in the Landscape Species Approach will enable us to strengthen existing relationships and identify and initiate new ones. The Threats Assessment will produce a description of threats as determined from a wide range of stakeholders, and an assessment of these stakeholders' capacity to alleviate those threats. These results will feed directly into more specific conservation planning. Additionally, participation in the Landscape Species Selection and building of Threats and Biological Landscapes will allow us to identify key partners with knowledge of our Landscape Species and Threats. We hope that these strategic planning tools will provide focus, increased collaboration, and energy to the conservation activities on the steppe.

Threats Addressed:

A major problem in Mongolia, and particularly with regard to actors working in the Eastern Steppe, is poor collaboration and information sharing and thus an inability to mobilize against existing and new threats to the system. This is at least partly due to a lack of awareness and understanding of what other parties are doing, and the interactions and effect of these activities on the Eastern Steppe as a whole. Through meetings, presentations, and a threats assessment, the project is developing linkages across the political landscape to encourage collaborative activities and lessen negative impacts through poorly planned projects. This coordination is intended to develop better understanding among potential partners of the suite of threats to the Eastern Steppe, and to begin to forge common strategies for addressing them.

Meeting as a team of conservation organizations and concerned citizens and requesting information from the Ministry of Nature and Environment and Members of Parliament (MP) on a regular basis has proven to be an effective way to maintain pressure on policy makers to be transparent about current development plans in the region. Impacts of this kind of contact have already been seen early in FY06, as a second proposal to build a bridge in the Nomrog Strictly Protected Area (SPA) was voted down by a team of MPs and Ministry officials sent to assess the bridge site in Nomrog SPA. (WCS conducted a fact-finding mission in November 2005, to Sumber soum and Nomrog SPA area to confirm that the bridge project had been halted.) The possibility of this bridge being built has been noted as one of the major threats to the region's wildlife.

Activity 1.3 Develop an adaptive, participatory and spatially explicit strategy for threat abatement and landscape conservation

Activity 1.3.1 Eastern Steppe Landscape Species will be chosen through WCS's Landscape Species Approach

The Landscape Species Approach is a wildlife-based strategy used to define ecologically meaningful conservation areas, identify where and why human-wildlife conflicts occur, design and undertake conservation efforts to curb or halt such conflicts, monitor program effectiveness, and adapt conservation efforts in light of these results (LLP Bulletin 2¹). A suite of target species provides the backbone of the approach, and is identified based on criteria such as their area requirements, use of different habitats, vulnerability to multiple threats, socio-economic significance, and ecological functionality. This suite of species will be used in upcoming years to help define essential conservation lands and management priorities that are necessary to maintain the biodiversity and integrity of the Steppe, and assist the program in determining future conservation interventions (LLP Bulletins 3 and 4).

Existing data have now been collected on a wide range of potential landscape species for the Eastern Steppe region as well as connections made with numerous local research institutes (e.g., National University of Mongolia, National Academy of Sciences) and over 20 international organizations (including ICF, JICA, WI). These data and connections will help inform overall spatial analyses, will enable us to define the extent of the landscape and locations in which conservation efforts should focus, as well as to identify priority actions in areas of critical conservation importance and conflict (see Activity 1.3.2).

Beginning in the late spring of 2006, the program with assistance from New York Living Landscapes Program staff will convene an expert panel to help select a complementary set of target landscape species. Conservation activities designed to reduce threats to these target landscape species will be implemented in collaboration with our project partners from the academic, NGO and governmental sector. Implementing these conservation projects will not only reduce threats but in the Eastern Steppe, but will also build capacity in the next generation of scientists, conservationists and resource managers in Mongolia.

Results/Outputs:

A complementary suite of Eastern Steppe Landscape Species will be chosen based on the participatory Landscape Species Approach. This suite of species will be used to help define conservation lands and management priorities and assist the program in focusing conservation interventions (see Activity 1.3.2).

Threats Addressed:

¹ For copies of bulletins, please visit our website www.wcslivinglandscapes.org or email llp@wcs.org

A wide range of human activities threatens ecologically functioning populations of most species found on the Eastern Steppe. Yet little information is available on many of these species or explicit threats that they face, which increases the likelihood that these threats will continue to negatively impact wildlife and ecosystem processes. The Landscape Species Approach is focused on ensuring that conservation investments are made to address the environmental needs of, and threats to, a suite of landscape species. By doing so, not only will landscape species and the habitats they require survive over the long-term, so too will the assemblage of other plant and animal species - and important ecological functions - be sheltered under their ecological umbrellas.

By addressing the needs of these species, WCS and Mongolian conservationists can explicitly assess threats to their long-term persistence and set priorities for conservation actions to avoid or mitigate key conflicts with people. The approach can serve as the basis for developing transparent and participatory relations through consultations with numerous stakeholders who are essential to development of land management policies and practices that may resolve conflicts between people and wildlife. An example of the Landscape Species approach in action is the work that has been done through discussions with local stakeholders in the Sumber soum community in Dornod aimag. The Landscape Species approach has been introduced as a way to make decisions about the designation of local protected areas. It will be used more fully in the future and will provide a framework for the decision making process of local officials and community members in the management of the Buir Lake community protected area and conservation project.

Activity 1.3.2 Develop a spatially explicit representation for threat abatement and landscape conservation

To date, WCS has collected, organized, and clarified existing GIS information for the Eastern Steppe (from ESBP and other sources), and sourced remote sensing data. The information collected thus far has been distributed in CD form to interested government agencies and NGOs. Early in the program, WCS LLP staff conducted an assessment of GIS and remote sensing capacity in the Mongolian natural resource sector, and worked closely with scientists familiar with steppe ecology and previously created vegetation maps to assess the quality of existing vegetation classification/land cover data and utility of these data for modeling habitat quality. In the fall of 2005, we will hire a Mongolian GIS and remote sensing specialist and use the data collected to date to design and create map-based Biological Landscapes and Human Landscapes for the region.

The Mongolian GIS specialist will work closely with the staff from the Living Landscapes program in New York to build Biological and Threats Landscapes. Information from Threats Assessments (Activity 1.2) will be used as input data for building Human Landscapes specific to each our chosen Landscape Species: spatial models reflecting the impact of human activities on Landscape Species (see Activity 1.3.1). Habitat location and quality information, combined with knowledge of ecological needs of selected landscape species will be modeled and used to produce a set of Biological Landscapes: critically important habitats for these species. Preliminary Biological and Human landscapes will be completed by Summer 2006. We will overlay Biological and Human Landscape maps to examine their intersections, and design a spatially explicit representation of where the needs of humans and wildlife conflict and where they are compatible or mutually beneficial. This will form the basis for our work with a range of stakeholders, including local NGOs, and a variety of agencies such as the Protected Area Administration (PAA), and will help us to characterize and reduce obstacles to successful management design and implementation.

Results/Outputs:

Staff will create a set of spatially explicit landscape models that will detail Eastern Steppe ecological and socio-economic structures and systems, indicating key threats, conservation conflicts, and opportunities. These models will include: Biological Landscapes for each of the selected Landscape Species, Human Landscapes representing the influence of human activity in the Eastern Steppe, and conservation landscapes that reflect the integration of both. These analyses will be critical for planning effective conservation efforts, both by this project and by the government of Mongolia.

Threats Addressed:

The enormous area of the Eastern Steppe makes sensible conservation planning difficult, which allows new and existing threats to continue to flourish 'under the radar' of present institutions. A landscape model overlay of the Eastern Steppe will help identify specific threats to conservation targets, their locations, key partners to involve, and

will provide the groundwork for addressing these threats. Spatially explicit details of the model will allow planners to examine impacts that potential activities might have on the steppe ecosystem and mitigate these threats to avoid negative results. This will be an essential tool in our on-going work to engage the oil and mineral extraction companies and the Mongolian Ministry of Nature and Environment in efforts to mitigate the negative impact of development initiatives on wildlife and wild lands in the Eastern Steppe in the region.

Activity 1.3.3 Identification of points for critical action to conserve Eastern Steppe Landscape Species

Understanding the patterns of distribution and basic biology of our conservation targets or Landscape Species is critical to the effective and appropriate placement of threat-reducing interventions. Much information for our Biological Landscapes has been generated through earlier and on-going WCS-led research in the Eastern Steppe and gathered through review of previous work done by others, however, a critical need to study candidate Landscape Species remains. Opportunities exist to build on current projects in the region to generate data of specific value to the Landscape Species Selection process.

The Nomrog Bridge: Plans to build the “millennium road”, a national project to build a road across Mongolia, continue to be associated with recommendations from the Mongolian government to designate protected areas. Of particular concern to the Eastern Steppe region has been the plan to build a bridge into and across the Nomrog Strictly Protected Area. WCS took part in efforts to stop the building of the bridge in its originally proposed site in 2002/2003, however, according to reports an agreement has recently been signed between a member of the Mongolian government, MP Zorigt from Choibalsan, and the Chinese provincial government in Arshan in NE China to build the bridge. There is a critical need to gather accurate information on the plans for the road and bridge development so that action can be taken across the conservation community to challenge this development decision. Meetings are scheduled for early October, 2005, with our partners in the conservation community (WWF, Union of Mongolian Environmental Non-Governmental Organizations, and Initiative for People Centered Conservation to organize an effort to acquire the information we will need to provide alternatives to the current course of the “millennium road” to ensure that its impact on the biodiversity and habitat of the region is minimized.

The Mongolian Gazelle: Although the final suite of Landscape Species has not yet been selected, one of the clearest candidates for adoption as a Landscape Species is the Mongolian gazelle. The gazelle ranges widely and interacts strongly with people in the landscape. WCS staff will continue focusing on understanding the ecology and life history of the gazelle in order to develop a sound management plan to ensure the survival of this key species, as well as maintaining a functional steppe ecosystem and a sustained source of revenue for local people.

In 2005, we continued to work in collaboration with the Smithsonian Institute’s Remote Sensing Laboratory to design a model of the pattern of gazelle habitat selection on the Eastern Steppe in order to help us manage gazelle relative to human activities. Models built to predict gazelle habitat selection in the spring and summer were extended to include the fall and winter months. We expect that our data will show that gazelles select habitat based on vegetation quality as before, but we expect that they may also respond to patterns in snowfall. Vegetation information was collected through site visits in the Eastern Steppe in the summer of 2005 to validate information collected via satellite and improve our assessment of overall vegetation quality of the steppe which is an essential piece of the model assessing gazelle pasture preference and habitat selection. For proper conservation of gazelle, it is critical that we understand what habitats are important for gazelle, how they are moving among these habitats, and if important habitat is consistently located in the same place from year to year. If important habitat shifts from year to year, as we suspect given preliminary analyses, it will be critical that the steppe remain as unfragmented as possible.

In the summer of 2005, we completed a range-wide driving survey designed to estimate the population size and regional population density of the Mongolian gazelle. In the fall and winter of 2005, we will proceed with the final analysis of these field data and incorporate this information into our modeling efforts and eventual creation of a Biological Landscape for gazelle (see Activity 1.3.2). In the spring of 2006, we will proceed with aerial transects to compare with the count generated by the range-wide driving transect of 2005, to produce a statistically rigorous baseline estimate of gazelle population size. Coupled with a more accurate estimate of calf survival generated from our long-term efforts monitoring the status of radio-collared calves during their first year of life, we will use the

information to focus interventions (e.g., reducing poaching in certain areas or at certain times) to have the strongest impacts on the health of gazelle populations.

Gazelle team members will also continue to make gazelle management recommendations to government (see Activity 2.1), give lectures and media interviews, and publish reports locally to make people aware of the steppe's uniqueness and importance. WCS will also continue to coordinate with others beyond the national borders in areas where the gazelles migrate seasonally, including both Russia and China. We will work to review telemetry data that is being collected by Russian scientists using equipment provided by WCS in previous years with the long-term goal of promoting a gazelle management plan that incorporates information from population monitoring throughout the gazelle range. A new initiative to track the movement of gazelle along the trans-Mongolian railway (connecting China to Russia across Mongolia) will be initiated in November of 2005, with Dr. Ito Takehiko from the Arid Land Research Center of Tattori University, Japan, in collaboration with the Mongolian Academy of Sciences. Four satellite collars will be placed on two adult Mongolian gazelle captured on the east side of the railroad and two gazelle captured on the west side of the railroad. Data will provide important information about gazelle movement in this region of the steppe and the impact of the current railroad barrier.

Cross-border coordination to manage and protect the Mongolian gazelle will be developed by facilitating, establishing and supporting Russian-Mongolian and Chinese-Mongolian collaborative research initiatives. Many of these collaborative projects have been initiated through contacts made at the Gazelle Management Workshops hosted by WCS and supported by USAID in Mongolia. In addition to the collaborative work described in the paragraph above, Dr. Wang Xiaoming from East China Normal University, has expressed interest in collaborating with WCS and its Mongolian partners on the study of Mongolian gazelle in Inner Mongolia and Dr. Vadim Kirilyuk, now with WWF in the Russian Far East, continues to build on Mongolian gazelle work originally performed alongside WCS in the Eastern Steppe in the late 1990's.

These collaborative research efforts build links within the scientific and conservation community to collect the information needed to inform cross-border gazelle management policy. Two opportunities to use this information to inform international gazelle management policy include the Mongolian Mammal Biodiversity Databank Workshop to be held in Ulaanbaatar in November 2005, and organized by the Zoological Society of London and the National University of Mongolia. IUCN (World Conservation Union) criteria will be used to assess the regional conservation status of Mongolian mammals and WCS will provide information necessary to upgrade the regional conservation status of the Mongolian gazelle from "vulnerable" to "endangered" based on the rate of Mongolian gazelle population decline in Mongolia and border countries and the lack of initiatives to mitigate the threats that would change this trend. In addition, the Mongolian gazelle will be included on the agenda of the 7th Conference of Parties of the Convention of Migratory Species (CMS) meeting held in Nairobi, Kenya, in November, 2005. The WCS-USAID workshop on Mongolian gazelle held in Ulaanbaatar in 2004, contributed to the raising of awareness among the CMS community of the conservation status of this species and Mongolian gazelle biologist, Dr. B. Llagvasuren from the Mongolian Academy of Sciences will attend the meeting in Nairobi

The Siberian Marmot: Another strong candidate for adoption as a Landscape Species in the Eastern Steppe is the Siberian Marmot. Like the gazelle, the Siberian Marmot interacts strongly with people in the landscape: recent dramatic declines in marmot abundance are potentially devastating given its important functional role in the steppe ecosystem and as a sustained source of revenue for local people.

Data collected in the summer of 2005, on the distribution of marmots on the Eastern Steppe will be analyzed and used to strengthen the policy to protect this species. There is a current 2-year nation-wide ban on hunting marmot, and baseline information collected in the summer of 2005, will be used to assess the impact of this ban and inform policy decisions on future management of this keystone species.

Data collected in the summer of 2005, was presented at the 5th International Conference on Genus *Marmota* held in Tashkent, Uzbekistan, in late August. Data from Mongolia was included among contributions from France, Great Britain, Italy, Russia, Uzbekistan, Canada, China, Czech Republic, Kazakhstan, Kyrgyzstan, Nepal, Tajikistan, Ukraine and the USA. This data will be used to create the "Survival Strategy and Action Plan on Genus *Marmota*" and

the previously mentioned study will ensure that Mongolia continues to be included in international cooperation in the field of marmot research and conservation and that the plan includes marmot conservation concerns in Mongolia and the Eastern Steppe.

Other Potential Landscape Species: The steppe wolf is one of a number of carnivores of ecological and potentially economic importance on the Eastern Steppe. Efforts to learn more about the importance of gazelle-human-ecosystem interactions by studying gazelle-wolf interaction in the Eastern Steppe has proven difficult. Initially attempts to capture and collar wolves were successful but long term monitoring was impossible due to the almost immediate poaching of the collared animals. The poaching of the collared wolves was coupled with observations of heavy wolf hunting in the isolated and protected study area. In FY 2006, attempts to monitor the wolf population in the Eastern Steppe will continue with the goal of describing patterns and factors driving livestock/wildlife interaction identify interventions to protect this important steppe species.

Surveys in Numrog Protected Area to assess the population status of and threats to several ungulates (moose, red deer, and roe deer) were completed in the fall of 2005. These data will be used to build our biological landscapes for these candidate species in the Eastern Steppe and direct conservation efforts.

A study to assess the feasibility of reintroducing the Przewalski's horse (takhi) to the Eastern Steppe was completed in 2005. The final report of the study will be distributed in the fall of 2005 with the hope that the United States Przewalski's Horse Taxon Advisory Group will move forward with their intentions of becoming involved with and supporting takhi horse reintroduction efforts in Mongolia.

WCS will continue to explore opportunities for collaborative work with partners interested in conservation of wildlife species across the Eastern Steppe and build on initial work to conserve the wetland and aquatic communities that are important for numerous migratory bird species. This will include work with the Ornithological Society of Mongolia, as well as potential collaborative ventures with bustard experts Dr. Patrick Osbourne (UK), and others from Russia and Spain.

Results/Outputs:

A refined model of gazelle habitat use will be produced to improve our understanding of gazelle movement and long-term habitat requirements, so that the areas necessary to maintain a functional population of gazelle can be conserved. These studies have already laid the groundwork and will continue to contribute to a solid scientific understanding of gazelle biology, behavior, and movement patterns to inform policy regarding sustainable harvest regulations, land-use issues, and development plans on the Eastern Steppe. For example, the development of a second rail line, to allow 2-way traffic, is currently under discussion in Mongolia. Information from the collaborative study described above will likely confirm the negative impact the current rail line has on gazelle migration. Information from the study will be provided to the Mongolian railway commission with suggestions for "gazelle-friendly" adaptations (e.g. the construction of under and overpasses and the use of alternative fencing materials) to the current and additional planned railway line that would reduce the negative impact of this development project on gazelle migration and conservation efforts in the region. The Siberian Marmot study in the Eastern Steppe will provide important baseline information to evaluate the effectiveness of current marmot management policy. Attempts to initiate new projects and collaborative efforts have enhanced our understanding of the level and nature of the threats facing the wildlife of the Eastern Steppe.

Threats Addressed:

Gazelles face a number of threats on the Eastern Steppe. Previous government policies were based on incorrect assumptions about populations and trends. Poorly designed development schemes and changing land-use practices are likely to negatively affect gazelles by curtailing their migrations, while poaching for meat or skins is an immediate issue facing them. The gazelle population cannot be managed as a renewable resource unless poaching is curtailed and an accepted sustainable harvesting program established. However, such a program must be based on solid scientific data collected in the field to ensure a sustainable harvest based on accurate stock assessments. The data collected by this research will lay the foundation for a sound management plan that will help to ensure not only the survival of the species but the steppe ecosystem as a whole. This will be accomplished by 1) using the outputs from the participatory

gazelle management workshop to write and build support for a science-based gazelle management action plan which will be incorporated into currently established protected area management plans created by the Protected Area Authorities; 2) providing the results of scientific studies to the Protected Area Authorities of the Ministry of Nature and Environment and the aimag-level Environmental Inspection Offices responsible for setting hunting quotas, many of which are unsustainable; 3) using the data from the scientific research projects to inform efforts to flag the endangered conservation status of the Mongolian gazelle through the Mongolian Mammal Biodiversity Database and meetings held by international organizations such as the CMS and CITES; and 4) by using the data to encourage public and private sector participation in the design of alternatives to current infrastructure development and mineral/oil extraction plans - that would mitigate the impact of this development on Mongolian gazelle populations, other Landscape species and the Eastern Steppe ecosystem. More specifically, the American SOCO oil exploration company pulled out of the Eastern Steppe in 2005, and was replaced by PetroChina (Daqing) Oilfield Company. WCS will continue to meet with the new management of Daqing, at their field camp in Dornod aimag (as was done in November 2005). Current and planned oil drilling in the region overlaps significantly with Mongolian gazelle habitat, calving grounds and migration routes. Mr. Pei, Daqing site manager, has voiced interest in continuing to receive information from WCS on Mongolian gazelle and other conservation concerns in the region, and WCS will continue to engage with this stakeholder to provide input that will inform infrastructure development and drilling plans so that impacts on wildlife population dynamics on the Eastern Steppe are minimized. Additionally, contact will be made with PetroChina management in China.

Important gazelle habitat (such as high quality grasses and calving areas) may not be consistently located in the same place from year to year and may not be well represented in protected areas. Poorly planned land use and development schemes threaten the integrity of the steppe for gazelles, and our research will provide clear information about which areas and movement corridors need greater conservation in light of oil exploration, road, and railroad development.

Relatively little is known about many other potential landscape species in the Eastern Steppe, from both an ecological and conservation perspective. With the potential of future development in the steppe, it is critically important to develop baseline studies of these species so that current management and future development, if it occurs, can be done wisely. Initiation of new projects and collaborations with other researchers is the first step in understanding the conservation situation for these species.

OBJECTIVE 2: Develop and implement sustainable and adaptive mechanisms to strategically address threats across the landscape

Activity 2.1 Establish necessary management mechanisms.

Mongolian Gazelle Management and Action Plan: In October of 2004, WCS organized an international gazelle workshop in Mongolia with the goal of moving toward the development of a sustainable management plan for the Mongolian gazelle across its range. The workshop was designed to produce recommendations and strategies regarding ecological research on gazelles; reducing conflicts between humans, their livestock and gazelle; and protected area management and creation. The workshop was attended by Mongolian and international scientists from the US, Japan, UK, Belgium, China and Russia. There were over 100 participants representing the relevant stakeholders in the Eastern Steppe including government officials, resource managers, protected area staff, NGOs and local community members. Recent and on-going Mongolian gazelle research findings that are critical to inform management decisions including population size, trends, breeding biology, migration, and behavior were reviewed and a priority-setting exercise to determine future research and conservation needs (led by Living Landscapes Program staff from New York) was carried out. Results of the workshop included a list of recommendations and the establishment of an international Mongolian Gazelle Working Group. This working group will schedule meetings to continue to address the development issues, land use issues, protected areas, and transboundary issues with China and Russia that are critical to the establishment of a Mongolian Gazelle Management and Action Plan. WCS will ensure that the recommendations of the working group are presented to the government of Mongolia. Where appropriate WCS will adapt its conservation strategy in the Eastern Steppe to incorporate actions identified by the working group. This plan, expected in FY 2006, will address the management of gazelle within the national boundaries of Mongolia but also set

the groundwork for future agreements between Russia, China and Mongolia on gazelle management and conservation - looking to the eventual establishment of one or more transboundary gazelle peace parks.

Wildlife Trade in Mongolia: In the summer of 2005, with financial support from the World Bank, WCS conducted a nationwide study to quantify the use and trade of wildlife in Mongolia and assess the potential impact of these activities on wildlife populations and local communities. There was agreement across the agencies and institutions represented that wildlife trade is having serious impacts on endangered species as well as several other species that occur in Mongolia and that without immediate measures to change current trends a permanent loss of biodiversity in this region of the world is imminent. Outputs to the workshop included recommendations for improving domestic and international enforcement, monitoring, research and community-based approaches to management. WCS will initiate a wildlife protection program with a large wildlife law enforcement training component (see Activity 2.2.1) as a direct response to the recommendations generated at the workshop concluding the wildlife trade study.

In addition to raising awareness about this serious issue and facilitating the future involvement of TRAFFIC East Asia in the region through a training program with the Mongolian Customs Authority, WCS initiated an assessment of the training needs of enforcement agencies in the Eastern Steppe with the intention of building their capacity to enforce wildlife trade regulations and prevent poaching in the region. Follow-up on this assessment will develop into a local capacity building initiative detailed in activity 2.2.1.

Brandt's Vole Management Recommendations: The report from the Brandt's vole management workshop held in 2004, was printed and distributed in 2005. As a result of the recommendations drafted at the conclusion of the workshop, the widespread use of Bromadiolone to poison Brandt's voles in Mongolia has been discontinued. The Mongolian government is currently investigating the effectiveness of non-toxin-based alternative practices to controlling Brandt's vole populations. Vole control policies and actions will be monitored by WCS and partner organizations including WWF-Mongolia and the UNDP-GEF Sustainable Grasslands Management Program, in an effort to ensure that international best practices are followed and management actions are implemented that account for the highly cyclical population cycles of the short-grass specialist characteristics of the Brandt's vole. Monitoring is accomplished by scheduling yearly meetings with the Plant Protection Institute (responsible for Brandt's vole control policy) to gather updates on the national level plans for vole management. These meetings are followed by assessments in the field through interviews of local aimag and soum-level officials in the agriculture departments responsible for implementing the central government vole control programs.

IBA Surveys: Data from Important Bird Area (IBA) surveys conducted in Mongolia in collaboration with the Royal Society for the Protection of Birds, the National University of Mongolia, the Protected Areas Administration, and the Daurkii Nature Preserve in Russia were analyzed and are prepared for publication in a forthcoming book on Mongolian IBAs. The IBA surveys provided some of the baseline information that is an essential prerequisite to planning and monitoring management actions for waterbirds and their habitats. Mongolia's grassland ecosystem contains numerous scattered wetlands that play a significant role in the Asia Pacific Migratory Flyway. Wetlands in Mongolia were identified as critical stopover sites for hundreds of thousands of migratory birds, ranging from numerous arctic breeders to six species of crane. These sites also serve as critical breeding grounds for an array of globally threatened species. The published report will be presented to the Mongolian government in November of 2005 with the recommendation that the identified sites be designated as official protected areas. WCS will put the Mongolian government in contact with individuals and organizations within the broader IBA community willing to assist with building the support for the establishment of the protected areas.

Takhi Reintroduction Feasibility Study Report: Completed in 2004, this feasibility study report will be published and distributed within Mongolia and to interested parties in the United States in an effort to coordinate plans for the successful reintroduction of Takhi or Przewalski's horses in the Eastern Steppe. WCS will provide logistical support through our partners in the Eastern Steppe should plans develop to reintroduce the Takhi to the region.

Report on Survey of Large Mammals in Eastern Mongolia's Nomrog Strictly Protected Area: The report from the survey, completed in 2004, will be used to reinforce the importance of this protected area as one of the last remaining pristine pieces of Manchurian steppe and habitat for moose, roe deer and red deer. The baseline information collected in the 2004 study was presented to the Protected Area Authorities and State Border Defense Agency as a means of highlighting the importance and uniqueness of this Strictly Protected Area (SPA). In this way the data collected through the study was used to generate support for on-going wildlife monitoring and the development of a collaborative wildlife protection program in Nomrog SPA. The collaborative wildlife protection program will

specifically address the poaching activity documented during the Nomrog large mammal survey, with the interventions and institutional capacity building outlined in activity 2.2.1.

Results/Outputs:

The Mongolian Gazelle Management and Action Plan is expected to: (1) identify necessary immediate gazelle conservation actions to be undertaken by the government of Mongolia and NGOs working in the region including WCS; (2) provide a framework for the long-term management of gazelle on the Eastern Steppe; (3) provide a mechanism for adaptive management through the a regular reevaluation of the management and action plan by the Mongolian Gazelle Working Group; and (4) provide a longer and broader range vision of gazelle management beyond the political border of Mongolia through agreements between Mongolia, Russia and China on gazelle management and conservation with the potential of creating one or more transboundary gazelle peace parks. The Wildlife Trade Study and Workshop are expected to raise domestic and international awareness of the potential crisis of biodiversity and impacts on livelihoods if the current trend of wildlife use and trade in Mongolia continues. Publication of the Brandt's vole workshop report is expected to put pressure on the Mongolian government to adopt internationally recognized best practices in rodent control. The IBA survey results are expected to direct future designation of formal Important Bird Areas in Eastern Mongolia and proposals to the Mongolian government to designate selected sites identified by the surveys as globally important as official Protected Areas. The Takhi Reintroduction Feasibility Study and the Survey of Large Mammals in Eastern Mongolia's Nomrog Strictly Protected area are expected to provide important information and suggestions for the current and future the management of endangered wildlife inhabiting protected areas of the Eastern Steppe. We will continue to work closely with the appropriate government agencies, working groups and local stakeholders to encourage the incorporation of recommendations generated into legislation and practice.

Threats Addressed:

The government lacks information on priority conservation issues and does not currently have access to international best practices regarding these issues. Without this knowledge, management decisions are unlikely to be sustainable and thus threaten sustainability of steppe biodiversity, ecological processes, and traditional culture.

For example, there is now agreement that wildlife trade is having serious impacts on endangered species as well as several other species that occur in Mongolia, and that without immediate measures to change current trends a permanent loss of biodiversity in this region of the world is imminent. The nationwide wildlife trade study noted above includes a series of recommended interventions necessary to address illegal wildlife trade and hunting in Mongolia, and a focused "collaborative wildlife protection program" will be set up in Nomrog SPA.

Activity 2.2 Enhance local capacity to implement the strategy.

Activity 2.2.1 Enhance Local Institutional Capacity.

Collaborative Wildlife Protection Program in Nomrog SPA: A number of WCS-led initiatives including the Protected Areas Needs Assessment completed in 2004, the Wildlife Trade Study and Workshop, the Important Bird Area Survey and the Large Mammal Survey in Nomrog Strictly Protected Area (SPA) mentioned above (2.2.1) have highlighted the threats facing the unique wealth of biodiversity in Nomrog Strictly Protected Area. The location of Nomrog SPA - on the Mongolian border with China - exposes it to significant cross border poaching, as well as threats linked to the planned development of major infrastructure. This includes plans for a bridge and road that would undoubtedly increase poaching pressure and fragment habitat that currently supports multiple wildlife species included in the CITES Red Book, species considered rare and/or endangered. As a border zone, Nomrog SPA is under the jurisdiction of the State Border Defense Agency (SBDA) as well as the Protected Area Administration (PAA). The SBDA staff is stationed within the reserve and is its only permanent human residents. This situation provides a unique opportunity to promote a collaborative effort between the SBDA and PAA and WCS to enhance wildlife protection in the SPA and highlight the important role of law enforcement staff in conservation.

In August of 2005, Tony Lynam, WCS Asia Training and Capacity Development Director, assessed the enforcement needs of Nomrog SPA, identified current agencies responsible for enforcement, and generated support for a

collaborative wildlife protection program in the region. Interest came from government agencies, mainly the SBDA and PAA, to move forward on a collaborative approach to protecting the wildlife and wildlands of Nomrog.

An initial action will include a 7-day Wildlife Law Enforcement Training Workshop conducted by Tony Lynam for SBDA staff to learn the importance of wildlife and their role in conservation by: 1) reducing cross-border incursions; 2) reducing habitat encroachment monitoring for illegal development; and 3) reducing poaching by Mongolian and foreigners encountered within the park. This law enforcement training effort will be complemented by a renewed wildlife monitoring effort led by WCS within the SPA. The challenges of protecting Nomrog (lack of resources, low numbers of enforcement personnel, large areas to patrol) will remain. However, the establishment of mechanisms for information sharing among agencies with jurisdiction within Nomrog will enhance the interest in and the impact of conservation and enforcement efforts undertaken by the SBDA, PAA and WCS.

Results/Outputs:

A cohort of key personnel within the PAA and SBDA will be trained in wildlife law enforcement by WCS in the context of a protected area within a border zone. Through joint training activities, collaboration among Mongolian agencies will be established with the primary goal of protecting wildlife. This initiative will provide a concrete example of a way to enhance wildlife protection through skill enhancement (detecting and reducing wildlife crime) and collaboration among agencies. If effective, this strategy will be presented as an option for wildlife protection in similar locations elsewhere in Mongolia where protected areas overlap with border zones.

Threats Addressed:

Protected Areas throughout the Eastern Steppe face threats from illegal hunting, fishing, grazing, hay-cutting, and other activities that conflict with protected area objectives. Nomrog SPA makes up the eastern-most territory of Mongolia and the reserve has an extensive border with China. This border location and the planned development of a road and bridge to China in the region only increase its vulnerability to habitat encroachment, cross-border incursions and poaching by both Mongolians and foreigners in the region. Focused efforts to build the wildlife crime prevention capacity of institutions with jurisdiction within Nomrog SPA builds on the law enforcement skills of the SBDA, already located within Nomrog SPA, and their collaboration with the PAA to protect wildlife in Nomrog SPA and across the Eastern Steppe. A WCS “presence” in the region through on-going wildlife protection training and capacity building through joint wildlife surveying efforts will provide an opportunity to monitor activities related to government proclaimed intentions to degazette parts of these reserves to allow road building, mining exploration and other development in and/or across Nomrog SPA. Interaction with the SBDA and the PAA at the national and local level in the Eastern Steppe promotes the development of solid working relationships with these institutions and an opportunity to provide input at multiple levels of government into the decision-making processes impacting the management and protection of wildlife and wildlands in the region.

Activity 2.2.2 Enhance Local Community Capacity.

In a nomadic society, efforts to establish community conservation and sustainable natural resource management face the additional challenges of shifting grazing patterns and a complex system of land use that is influenced by both local government legislation and family tradition. Since Year 1, WCS has been active in developing connections with and collecting information from the local nomadic herder communities of the Eastern Steppe. As the primary stakeholders on the Eastern Steppe, herders have been included in survey efforts examining gazelle hunting patterns and the formal threats assessment for the region. In Year 3, efforts to design a program with the goal of facilitating co-management of natural resources on the Eastern Steppe will be refocused. A project site will be selected in the Eastern Steppe through consultation with local community leaders and based on requests received from Mr. Myagmasuren governor of Sumber soum for WCS assistance with community natural resource management plan development. IPECON (Initiative for People-Centered Conservation) will be engaged to assist with the initial community organizational meetings, goal setting and action plan development. IPECON is an organization with extensive experience facilitating community based natural resource management in other regions of Mongolia. The initiative will use a participatory, people-centered and process-oriented approach, recognizing traditional knowledge and resource management systems and acknowledging local communities as rights-holders to local resources. The goal of this work is the creation of community-led sustainable grazing practices and low-impact development schemes that can help alleviate poverty without damaging the ecosystem.

Results/Outputs:

An NGO-facilitated community conservation/sustainable resource management initiative will be designed with implementation expected to be launched at the end of FY2006. Through this initiative, and by explicitly defining the connection between a local community's natural resource base and its cultural survival, we expect that communities will become more effective and proud stewards of their ecological landscape and the biodiversity found therein. The communities themselves will greatly enhance their abilities to maintain their cultural heritage through sustainable management of their resource base.

Threats Addressed:

While the Mongolian Eastern Steppe has an extremely low human population, the nomadic transhumant pastoralism of the local people means that little of the landscape has remained unaffected by human activities, including the few existing protected area networks. Therefore, while there is still the potential to save large stretches of the landscape from environmental degradation, such protection can only occur if local communities are directly involved in the conservation process. It is critically important to build the capacity of local communities to better manage their natural resources in a sustainable manner, thus giving them the ability to make sensible and informed decisions about maintaining or altering their culture and traditions without the intense pressures that stem from resource depletion. By facilitating a community directed conservation/sustainable resource management initiative, we expect that habitat degradation and wildlife loss, from unsustainable practices such as overhunting and overgrazing, will be reduced.

Activity 2.2.3 Enhance Local Disease Management.

A range of diseases is endemic in livestock on the steppe. Outbreaks of diseases such as foot and mouth threaten wildlife, local livelihoods, the national economy and international trade. There is a critical need for science-based livestock and wildlife health policies and programs to minimize outbreaks, to put in place plans to reduce disease impacts on all sectors, and to pinpoint underlying factors contributing to health problems. It is also essential that a health monitoring program be initiated. A health monitoring program can prevent widespread animal death, including both gazelles and livestock, and epidemiological monitoring of sentinel species like gazelles can help determine the factors contributing to disease outbreaks or other ecological disturbances - including those with potential ramifications for people.

WCS-Mongolia in partnership with the WCS Field Veterinary Program (FVP) has been successful in fund raising efforts directed at addressing disease issues at the interface of wildlife, livestock, and human health on the Eastern Steppe. In April of 2005, WCS in partnership with Michigan State University (MSU) and the American Center for Mongolian Studies (ACMS) received a planning grant from the USAID Sustainable Agriculture and Natural Resource Management (SANREM) Collaborative Research Support Program (CRSP) to introduce the concept and advantage of using an integrated and multidisciplinary approach to studying and preventing infectious disease transmission among domestic and wild animal populations. The team from WCS, MSU and the ACMS conducted a workshop in June of 2005, with participants from across the veterinary, wildlife and human health sectors in Mongolia. Interest to pursue a long-term collaborative research and training program focused on the interface of wildlife, livestock and human health was high, and a proposal is currently under development to be submitted to the USAID SANREM CRSP program in September 2005.

The WCS Field Veterinary Program continues to train local counterparts, liaise with animal and public health officials and other partners through opportunities to conduct surveys and monitor the health of wildlife on the Eastern Steppe. In the fall of 2005, the WCS FVP will conduct virological and serological surveys for foot and mouth disease (FMD) in Mongolian gazelles. It is particularly important for us to understand the epidemiology of FMD. Gazelle are directly threatened by the disease directly and are also often blamed for transmitting the disease to livestock. A severe outbreak would not only threaten gazelle populations, but could kill many livestock and threaten local livelihoods. This planned survey, funded by the American Zoo and Aquarium Association (AZA) Conservation Endowment Fund, will provide initial data on whether or not gazelles carry FMD. Data from this initial survey will be used to refine the FMD research being proposed in this SANREM CRSP proposal by determining likely study areas (e.g., low ungulate density vs. high ungulate density sites) and providing initial training opportunities for Mongolian partners.

Results/Outputs:

Pending funding, through the SANREM CRSP program WCS will be involved in a long-term collaborative research and training program focused on the interface of wildlife, livestock and human health. The long-term project (4 years) will support two Mongolian post-graduate students who will receive their degrees through MSU and focus their research efforts on disease issues facing wildlife of the Eastern Steppe. Local Mongolian staff will be hired to run the veterinary program and liaise with Mongolian veterinarians and biologists in partner institutions, the Central Veterinary Services, of the Ministry of Food and Agriculture, the Academy of Sciences, the Center for Diseases with Natural Foci, Ministry of Health and the Institute of Veterinary Medicine. The long-term goal of the SANREM CRSP project is the development of animal health expertise and policy with a veterinary disease monitoring and management system in Mongolia that addresses wildlife as well as domestic animal health priorities.

Threats Addressed:

Livestock serve as persistent reservoirs for highly contagious and virulent diseases such as brucellosis, tuberculosis and foot-and-mouth. These diseases constitute a considerable risk to wildlife, and if transmitted to gazelles could have catastrophic impacts on population numbers and viability. Ironically, although there is no evidence to support the claim, gazelles have been blamed for spreading foot-and-mouth disease to livestock, and there have been demands to eliminate the large herds as a control measure. WCS veterinarians, working with local counterparts, have begun work in Mongolia to elucidate disease relationships between livestock and gazelles. However, without sensible livestock and wildlife health policies and programs, disease outbreaks are certain to occur, and preparations must be made to mitigate their impact. Another important aspect of human-livestock-wildlife interaction is the transmission of disease from smaller mammals. Many serious and potentially deadly diseases worldwide are known to be carried and spread by small mammal vectors, including rabies, hemorrhagic fevers (e.g., the plague).

Activity 2.2.4 Enhance Local Scientific Capacity.

Long-term management of biodiversity on the steppe will depend on the emergence of a skilled and dedicated cadre of Mongolian scientists who can apply themselves to the problems of biodiversity conservation. WCS has recently prepared a Memorandum of Understanding with the National University of Mongolia (NUM) to work with staff to identify Mongolian professional scientists, graduates, and students and assist them in developing research and conservation projects that meet the needs of conservation planning and monitoring, while providing field-based training for the next (or first) generation of conservationists in Mongolia. NUM students have been hired and trained through their participation in a broad range of WCS-field projects, including continued work with the Mongolian gazelle project, a Siberian marmot study on the Eastern Steppe, and an outbreak investigation of avian influenza in migratory birds.

Collaborative work with professors and students from Mongolia's academic and research institutions has led to the publication of multiple jointly authored manuscripts covering a wide range of conservation policy and scientific topics. These articles have made an important contribution to the body of knowledge available to direct conservation and natural resource management on the Eastern Steppe.

Through the WCS network of international experts in conservation, the Mongolia program has been able to facilitate the contribution of international expert opinion on two conservation priorities in Mongolia, Saiga Antelope and Gobi Bear, whose geographic area of emphasis falls outside the Eastern Steppe. This work has contributed to the development of capacity within Mongolia to address the management of these critically endangered wildlife populations.

In FY05, we anticipate that collaborative projects with the Mongolian scientific and conservation community will continue. We plan to formalize the opportunities for training NUM students by establishing an internship program that will involve selected NUM students in all aspects of our work - from fundraising and knowledge dissemination activities to field research. We will also continue to acquire conservation and wildlife management journals and texts and work with the Asia Foundation to donate them to the National University of Mongolia's new Science Library. In addition, we will also hire a Mongolian GIS specialist and train this person in conservation and ecological principles while developing his or her skills in GIS and remote sensing. WCS will continue to work with Mongolian professors,

biologists, and government agency staff to develop scientific writing skills and publish peer-review articles on issues relevant to conservation on the Eastern Steppe.

Results/Outputs:

The information collected and reports written by young Mongolian scientists are expected to provide input to and help determine government policies on wildlife and development of the Eastern Steppe, based on a fundamental understanding of steppe ecology and threats. Involvement of these Mongolian scientists will strengthen national advocates for sound information and policy.

Threats Addressed:

The Eastern Steppe region is slated for significant development. While shortgrass steppe systems appear simplistic and robust, extensive research in North American prairies and African savanna has shown that this is not the case, and mismanagement of vast steppe areas has occurred in China. To recognize potential deleterious impacts of human activity on the Eastern Steppe ecosystem, it is necessary to collect data on a wide range of conservation targets, and to understand heterogeneity in the system. At the same time, long-term management of biodiversity on the steppe will depend on the emergence of a skilled and dedicated cadre of Mongolian scientists who can apply themselves to the problems of biodiversity conservation.

Activity 2.3 Implement mechanisms for measuring success and adapting the landscape strategy.

Perhaps the most significant missing puzzle piece for determining long-term biodiversity conservation of the Eastern Steppe is information on the size of the gazelle population and migratory patterns. WCS staff will continue population research on Mongolian gazelles (see Activity 1.3.3). In FY06, we will initiate systematic aerial population surveys to complement the long-distance driving transects accomplished in FY05. This work will provide an accurate baseline population estimate for setting initial offtake rates, monitoring changes in gazelle numbers, and mapping seasonal distribution.

The plane that will be used for the survey arrived in Mongolia in the summer of 2005. Methodology to be used in the aerial survey has been developed with the assistance of Dr. Gordon Grigg and Dr. Tony Pople of Australia. The final permission to fly the plane was not granted as expected in the fall of 2005. The four-week aerial survey has therefore been postponed until the spring of 2006. Testing of methodology and training of the survey team will proceed in FY06.

We also plan to continue marmot surveying efforts. The Siberian marmot is a keystone species that is rapidly being hunted to local extinction throughout the Eastern Steppe, yet for which there are no adequate data to detect the rate of decline. The monitoring program is designed to determine the spatial distribution and local population density of marmot in the Eastern Steppe to document the presence or absence of population recovery. IBA surveys will continue in future years (e.g., 2006, 2008) to enable us to monitor trends in target populations and threatened species, and to determine if conservation initiatives are effective. Other specifics regarding species that will be the focus of our monitoring plans will be developed after we have selected Landscape Species (see Activity 1.3.1).

Results/Outputs:

An aerial survey of the Eastern Steppe will take place to locate and map major calving grounds and to perform the first-ever range-wide population survey of the Eastern Steppe's flagship species, the Mongolian gazelle. This will serve as the first population-wide survey, and therefore provide an essential baseline for monitoring future trends and estimating allowable offtake.

Threats Addressed:

The Eastern Steppe faces a significant threat from poorly designed development and resource management plans, as well as over-harvesting of gazelle. For example, previous government policies were based on incorrect assumptions about gazelle populations and trends, which led to poor enforcement efforts and a dwindling gazelle population. Monitoring can lead to better management decisions and improved management actions. WCS and Mongolian managers alike must have monitoring information if we are to make sensible wildlife management decisions, design appropriate conservation actions, and measure our success.

Activity 2.4 Identify and strengthen constituencies for conservation at local, national and international levels to help ensure effective strategy implementation.

WCS will continue to utilize our institutional network of conservationists around the globe to foster collaboration with international scientists on issues facing Mongolia and provide necessary links between Mongolian scientists and the international community. Collaborative ventures have continued through work with the IBA survey efforts, the Takhi reintroduction feasibility study and the Mongolian gazelle project. New international links were established this year through the Siberian marmot and wildlife trade study, with further work and collaboration planned with TRAFFIC East Asia and WCS Asia. Initiatives to strengthen the links between international and national conservation efforts and local communities through a community conservation education program will be refocused in FY06.

In FY06 material collected in Year 1 and 2 will be used to create Eastern Steppe focused wildlife educational programs to be disseminated in first primary and then secondary schools and community centers in the soums of the Eastern Steppe. With the assistance of WCS local staff, the new WCS interns from the National University will be charged with the task of creating the first edition of this educational program. The material will be designed so that it can be incorporated into the science curriculum currently used in Mongolia. Distribution of the printed material will be done in conjunction with presentations given by the NUM interns in selected classrooms throughout the region.

Results/Outputs:

A community conservation education program will be designed and ready for testing by the fall of 2006.

Threats Addressed:

Habitat degradation and wildlife loss from unsustainable practices such as overhunting and overgrazing is in part due to lack of awareness on the part of herders and local government institutions. Given the near-complete lack of interest in conservation at the central government level at this time, we believe the best way to currently reduce these threats is by addressing information gaps and stimulating dialog on these issues at the ground level in the Eastern Steppe. Through direct conservation education efforts directed at students and adult community members, we expect to begin a process of building awareness and eventually a grass-roots constituency for sound management and conservation.

OBJECTIVE 3: Learning and teaching best practices in the Mongolian Eastern Steppe landscape and beyond.

Activity 3.1 Using economic valuation of rangeland and water resources as a tool for site-based conservation: a comparison of the Eastern Steppe of Mongolia and Rungwa-Ruaha Landscape, Tanzania

The Eastern Steppe is one of a suite of WCS Living Landscapes that include grassland ecosystems, including Madidi (Bolivia), Rungwa/Ruaha (Tanzania), Patagonia (Argentina), and the Madison Valley (USA). In both the Mongolian and Tanzanian Living Landscape, nomadic pastoralism is an important feature of the landscape. Assessing the value of the natural resources, mainly water and rangeland that are of critical importance to pastoralists and the wildlife that share their landscape, is a challenge facing both sites. During the 2005 LLP meeting, an event designed to foster collaboration across sites and allow for the establishment of a network for communication, the representatives from the LLP Mongolia and Tanzania sites agreed to assess rangeland and water valuation in the context of their individual programs. Techniques for natural resource valuation in Mongolia and Tanzania will be pursued to improve conservation practices at the individual sites and also to share information between the sites as the projects are implemented.

Economic valuation of natural resources can be an important tool for conservation if used to: 1) quantify the ways in which conservation of natural resources can improve livelihoods; 2) raise public awareness about the economic value of natural resources local communities or nations may take for granted; and 3) define the “winners and losers” in the distribution of the benefits (value) of the natural resource. In FY 2006, the Eastern Steppe program staff will initiate a stakeholder-led economic valuation of the rangeland of the Eastern Steppe. The implementation plan for this component of the project is under development but it will be designed to build on data collected through “ger” interviews and participatory workshops held in FY 2005.

Results/Outputs:

Project staff will contribute to the “economic valuation” knowledge base by supplying a case study of the application of this approach in a grassland ecosystem with a nomadic pastoralist community. This “economic valuation” case study will be available by the end of FY 2006? for comparison to a similar effort in the Rungwa-Ruaha landscape in Tanzania. These case studies will contribute to the material collected by WCS/LLP to be used in the series of field manuals/workbooks, bulletins, peer-reviewed papers, and website information that will be produced by the WCS/LLP team (see LLP reporting which follows). The LLP learning portfolio will help permeate effective landscape thinking and approaches throughout much of the conservation community, and most importantly will improve conservation effectiveness. Over time, information and lessons learned from the development of the Eastern Steppe project also will provide an invaluable opportunity to compare best-practices within and across other projects and biomes to better identify key issues of global concern to the conservation community.

Gains made in analytical processes – from conceptual modeling and threats abatement, to methods for monitoring hard-to-count animals – should contribute to the enrichment and improvement of programs throughout the conservation community. Moreover, as WCS strategies and tools are communicated to conservation practitioners outside of our institution, WCS intends to stimulate critical thinking and more effective action in a broader realm. WCS has already seen other conservation implementers and donor agencies adopting aspects of our approaches and incorporating them into their operations, and we expect this trend to continue.

Threats Addressed:

Lack of recognition of the value of wild systems frequently leads to their conversion, over-exploitation, or degradation. Therefore, providing quantitative estimates of value and disseminating this information is expected to change local and national perceptions and actions regarding conservation. In addition, a learning framework will assist the project in critical self-evaluation, as well as in benefiting from the expertise and experience of conservation practitioners dealing with similar issues. At the same time, environmental threats are often global in extent, so lessons learned across the globe need to be synthesized and shared if adequate conservation abatement methods are to be designed and implemented here in Mongolia and throughout the world.

Objective 4: New York Coordination Unit Strategy: Guide the design and testing of wildlife-focused planning, implementation, and evaluation tools for effective conservation at a landscape scale, and promote learning across sites and beyond

The NY-based Coordination Unit (CU) of the program is designed to develop and test wildlife-focused, landscape-scale approaches to biological conservation across multiple sites. To ensure the widespread utility of these new conservation approaches, the program is testing them within landscapes that encompass a diverse array of ecological features, land-uses, resource-use issues, and jurisdictional arrangements. To develop new approaches, facilitate and harmonize testing and implementation among these core sites, and capture the synergistic benefits of diverse experiences, a central coordination unit is charged with designing and managing the program. This unit guides development of landscape-scale conservation strategies, tools and techniques; assists in the design and development of cost-effective intervention and monitoring programs at these sites; promotes cross-site learning; and ensures communication among the sites, WCS staff (central and field), USAID (DC and missions), and the larger conservation community.

During FY06, the priority for the Coordination Unit will include continuing to work with field sites to further develop their conservation landscapes, and providing assistance to the process of building monitoring frameworks from conceptual models. We have now refined and simplified the process for selecting landscape species, including development of software as a decision-support tool for analysis, and during the next year, we’ll develop and disseminate a ‘how to’ manual that will accompany the selection software. Also, based on the results from the ongoing review of the landscape species approach, we’ll write up a rules of thumb document on the appropriate conditions for the use of the approach.

Activity 4.1 Provide technical assistance to site-based conservation

Members of the NY Coordination Unit will provide technical input to field site operations detailed in the previous sections of this report, some of which will involve trips to sites. (as cited)

Results/Outputs:

Focused and timely technical assistance and collaboration provided to field sites based on needs, leading to conservation landscape strategies, target monitoring of effectiveness, and processes in place to increase participation of stakeholders.

Activity 4.2 Design, implementation, and testing of decision support tools

Activity 4.2.1 Living Landscapes Program technical manuals

The Living Landscapes Program will continue to produce brief how-to guides, called Technical Manuals, after field testing and fine-tuning the methods at several WCS field sites. In FY06, we will finalize and disseminate three technical manuals that are currently in review: Building Monitoring Frameworks from Conceptual Models; Conducting Household Surveys; and Building Biological and Human Landscapes. We will also produce a technical manual on selecting landscape species. The manuals are designed to provide clear and practical instructions to field practitioners on implementing a number of conservation tools. The manuals will also be translated into Spanish and French, and disseminated to WCS projects, partners (government, NGO and local), and other conservation colleagues.

Activity 4.2.2 Landscape Species Approach progress

4.2.2.1 Building Conservation Landscapes

In May 2005, at the LLP Annual meeting, 7 landscapes presented their preliminary conservation landscapes (i.e., maps of conservation priorities) and methods for making them, including how they incorporated biological and threat information. We concluded that while Biological and Threats Landscapes were vital information for choosing priority areas, how these 2 pieces of information should be weighted against one another (e.g., protect high value, low threat habitat first or high value, high threat) is still unclear, and may differ depending on the conservation context. Additional information may be necessary to make practical decisions on where conservation activities should take place, such as cost of conservation activities, urgency of the threats, probability of success, history of the project, and opportunities.

Over the first half of 2006, LLP staff in New York will continue to refine methods for building conservation landscapes, based on what we learned at the annual meeting. By January 2006, we will have drafted a Technical Manual on building conservation landscapes that describes the various types of spatial information that could be used in prioritizing areas, and suggests options for incorporating this information into a final map of priorities (e.g., simple rules, use of decision support software such as Marxan). By the end of FY 2006, we will have distributed this draft manual, asked 3-4 sites (Guatemala, Adirondacks, Madidi, and Glover's Reef) to use the manual and make new or refined conservation landscapes, and finalize the technical manual based on the experiences of these sites.

4.2.2.2 Review of the Landscape Species Approach

Review of the Landscape Species Approach (LSA) will continue during this fiscal year. An assessment of the use of LSA tools - amount of time spent on landscape species selection, level of participation in doing threats assessment, etc - will help us draw some principles to be able to advise others on the utility of the approach, its individual steps, and the conditions under which it may or may not provide advantages to conservation. LLP intends to use the findings of the review to better adapt our program and LSA tools for the practice of site-based planning and implementation.

4.2.3 Develop monitoring frameworks at sites

Over the past couple of years, all of the demonstration sites have developed and fine-tuned their conceptual models that can now be used to design their monitoring frameworks. We will work closely with these sites as they develop and refine their monitoring frameworks and monitoring plans during the next year, ensuring that sites go beyond concepts - into the practice of project monitoring.

4.2.4. Develop rules of thumb for intervention planning

A number of project staff have highlighted the need for intervention planning and prioritization tools - How to turn research into conservation action; How to build confidence in choice of intervention activity and place; How to take advantage of windows of opportunities, etc. During the last LLP annual meeting, the participants decided that the most useful guidance in determining priorities among interventions would be in the form of rules of thumb, and a small group began to outline some ideas that the CU will expand and make available to staff for review during the next few months.

Results/Outputs:

Technical manuals designed, tested in the field, and distributed in hard copy as well as on CDs and on-line for wider distribution. Monitoring frameworks developed for each site. A 'rules of thumb' document for intervention identification and prioritization and made available to field staff. Guidelines for effective use of LSA tools written up and made available to other site-based conservation practitioners.

Activity 4.3 Catalyze cross-site and cross-organizational learning, and communication

Activity 4.3.1 CMP: leadership, design, writing and audits

CU staff will continue to play a leadership role in the identification, design and implementation of Conservation Measures Partnership activities. We will work closely with Foundations of Success to begin population of causal chains and best-practice indicators in the Strategic Indicator Selection System (StratIS), and will work with all CMP members to identify best-practice tools to use as models for development of eAdaptive-Management modules. Lastly, we will continue to provide technical input into specifying measurable Global Indicators of Biodiversity status.

4.3.2 Local engagement in conservation survey

We will organize and host a 5-day writers retreat for several senior WCS field staff. The retreat is designed to capture their experience integrating local people into the successful practice of landscape scale conservation. This retreat follows-up a more widely distributed questionnaire that was used to frame the theoretical and practical issues associated with effectively integrating local people into the practice of conservation. The report generated during the writers retreat will be published as a WCS International Program Working Paper and will be made available as a PDF on our website and as a hard-copy document.

4.3.3 Preliminary assessment of the human welfare impacts of establishing national parks

With funding provided by the John D. and Catherine T. MacArthur Foundation and the National Science Foundation, LLP staff in collaboration with the WCS Gabon program, the Gabon National Parks Authority and Boston College conducted a baseline household welfare survey of 1,000 households with traditional claims to natural resources within 4 national parks in Gabon, and an additional 1,000 control households living outside the influence of the parks. This survey is the first of three surveys planned over the next 5 years to assess the income, health, consumption, natural resource use, and family function impacts of establishing protected areas on local families. Results of the baseline survey will be analyzed during FY06 and will allow us to assess the role that wild resources and market access play in the welfare status of families proximal to and distant from the parks.

Results/Outputs:

Synthesis of results of local engagement in conservation surveys compiled and made available for use. Results of the baseline study will be published in a peer review journal

Activity 4.4 Application of Living Landscapes Program tools beyond core sites

4.4.1 Training workshops in the use of LLP tools

A number of workshops to train field practitioners in the use of conservation tools will be organized and implemented throughout the year. Among others, the socio-economic monitoring specialist and the program director will hold a training workshop for conservation projects as part of the WCS Marine Regional Program Meeting. We have been asked by Dr. Glyn Davies, the Director of Conservation Programs at the Zoological Society of London to run a workshop to train his global staff on the use of LLP conservation planning tools. The 2-3 day training workshop will occur in London in November, 2005. In January of 2006 we will help local and international partners in the Samburu-Laikipia Landscape in north-central Kenya to use LLP conservation planning tools to come to a common vision for

wildlife conservation in this complex dry savanna landscape. We also expect to conduct a training of national park management staff in Madagascar in partnership with the WCS Madagascar program, and Conservation International. This training will focus on the use of conceptual models as a basis for strategic site conservation planning. Lastly, we will continue to support adoption of conceptual models and monitoring frameworks by landscape scale projects in: Brazil – Mamiraua, and Piagacu Purus; Peru - Yavari Mari; Venezuela – Caura River; Ecuador – Yasuni, and Bolivia – Gran Chaco. These projects are supported by funds from The Gordon and Betty Moore Foundation.

4.4.2. Technical Manuals

We will continue to make our series of technical manuals available to conservation practitioners and decision makers on our website, as hard-copy booklets and on CD. Manuals are available in English, French and Spanish.

Results/Outputs:

Training workshops and symposium planned and held to make available the principles distilled from implementation of the USAID/EGAT funded sites over the past six years to other site-based conservation projects around the world.

Activity 4.5 Ensure coordination and communication services for the program

The program director and program coordinator will meet with staff from the core sites and other WCS large-scale conservation sites to discuss the development of the program, on-the-ground implementation of the Landscape Species Approach, and further development of tools relevant to the approach. Program staff will also meet with collaborators, NGOs, governmental officers, and representatives of other stakeholder groups to promote use of the strategies and tools, to assess their utility, and to determine whether additional tools would be of use.

Throughout the year, the Coordination Unit will assist field staff in completing annual Implementation Plans, reporting on Performance Monitoring forms, and submitting Annual Reports. The program coordinator and other members (as necessary) will attend quarterly USAID/EGAT meetings in Washington DC and will ensure regular reporting and updates to USAID.

Results/Outputs:

The Coordination Unit will serve as a hub for communication regarding the Program among WCS field staff, core sites, current and potential conservation partners and interested members of the general public. Timely preparation and submission of USAID reports.